

COMMENTS

The enclosed is responsive to the Examiner's Office Action mailed on 3/29/05. At the time the Examiner mailed the Office Action claims 1-30 were pending. By way of the present response the Applicant has: 1) not added any claims; 2) not canceled any claims; 3) amended claims 1, 2, 13 and 27. As such claims 1-30 remain pending. The Applicant respectfully requests reconsideration of the present application and the allowance of all claims.

In the Office Action mailed 3/29/05, the Examiner objected to the use of "R" in paragraphs [0026] and [0029]. According to the Examiner

In paragraph [0026] and [0029], R is not defined. It appears as though R should be defined as it is in paragraph [0025], but it is requested that this be clarified.

See, Examiner's Office Action mailed 3/29/05, pg. 2. The Applicant respectfully submits that no amendment to the specification is required because R_3N and $R_4N^+OH^-$ are substances that are known by those of ordinary skill in the art (e.g., R_3N being a "tertiary amine" and $R_4N^+OH^-$ being a "Hydroxyl form strong base alkyl quaternary ammonium polystyrene copolymer"). The Applicant respectfully submits that the recitations of the R_3N and $R_4N^+OH^-$ substances by themselves is sufficient for one of ordinary skill to comprehend the teachings of the Applicant's specification and the subject matter being claimed by the Applicant.

The Examiner has also rejected all claims under 35 USC 102(e) in view of U.S. Patent No. 6,787,286 (hereinafter, "Szmanda"). See, Examiner's Office Action mailed 3/29/05, pg. 2. Here, it is pertinent for the Examiner to recognize a basic field of use regarding the present application. Specifically, paragraphs [0004] and [0005] indicate that the present application

is directed to a lithography approach in which a liquid is present between a lens and a layer of photoresist. In traditional photolithography systems, an air medium existed between a projection system lens and a layer of photoresist. By contrast, in an “immersion lithography” approach, in order to improve the index of refraction matching between the lens and the medium, a liquid medium exists between the lens and photoresist. The present application is directed to the later and not the former.

Paragraphs [0004] and [0005] of the present application, provided below, are particularly noteworthy in this regard.

[0004] The scanner used to illuminate the specified portions of the photoresist layer is a type of camera that forms the desired image on the photoresist layer. The scanner has a number of optical elements in conjunction, used to project the image of the pattern from the mask. The image proceeds from the last optical element of the scanner. The last optical element is therefore in proximity to the wafer with an air gap between the last lens element and the substrate. The index of refraction of the air is different from the index of refraction of the lens, which may typically be quartz (e.g., silicon oxide) or a calcium fluoride crystal. This mismatch in the indices of refraction results in diffraction that limits the minimum size and image quality of the projected image.

[0005] One method of reducing mismatched indices between the last lens element and the photoresist, is to place a liquid on the photoresist layer in contact with both the photoresist layer and the last lens element. The liquid is selected to match the index of refraction of the last lens element at the incident wavelength and is, therefore, referred to as an index-matching liquid (IML). By eliminating the air gap and providing a matched index of refraction, the IML helps reduce the diffraction allowing a greater portion of the image information to proceed from the scanner into the photoresist layer, which allows the projection of an image of higher quality. The IML may be selected to provide the best index-matching properties for

a given lithographic process. For example, if a 193 nm wavelength light is used to illuminate the photoresist layer, then a silicon-based lens may typically be used and water has a similar refractive index. For other illumination wavelengths, other types of lenses may be used and an alternative IML may be selected.

See, Applicant's specification, pg. 2.

Here, in order to re-emphasize the focus of Applicant's claimed subject matter, the Applicant has amended each of independent claims 1 and 13 so as to positively recite an "immersion lithography" claim element. The Applicant does not believe either of these claim amendments to be narrowing claim amendments. Independent claim 27 has not been amended to recite an "immersion lithography" claim element because its claim elements recite an immersion lithography system on their own accord (e.g., "an index-matching liquid in contact with the lens element").

With regard to the Szmanda reference, the Applicant respectfully submits that it is not possible for the Szmanda reference to anticipate any of the Applicant's independent claims because the Szmanda reference is not directed to photoresists used for immersion lithography. That is, the Szmanda reference contains no express or implied suggestion that that photoresists or solvents of Szmanda be applied to immersion lithography, and, therefore, the teachings of the Szmanda reference fail to cover the immersion lithography related elements of the Applicant's claims.

Therefore the Applicant's claims are patentable over the Szmanda reference. Because the Applicant has demonstrated the patentability of all pending independent claims, the Applicant respectfully submits that all pending claims are allowable. The Applicant's silence with respect to the dependent claims should not be

construed as an admission by the Applicant that the Applicant is complicit with the Examiner's rejection of these claims. Because the Applicant has demonstrated the patentability of the independent claims, the Applicant need not substantively address the theories of rejection applied to the dependent claims.

Conclusion

If there are any additional charges, please charge Deposit Account No. 02-2666. If a telephone interview would in any way expedite the prosecution of this application, the Examiner is invited to contact Robert B. O'Rourke at (408) 720-8300.

Respectfully submitted,

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Dated: _____

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